



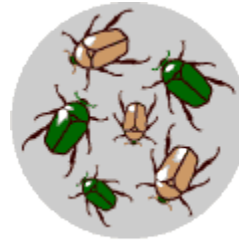
## Natural selection

Natural selection is one of the basic mechanisms of evolution, along with mutation, migration, and genetic drift.

Darwin's grand idea of evolution by natural selection is relatively simple but often misunderstood. To find out how it works, imagine a population of beetles:

1. **There is variation in traits.**

For example, some beetles are green and some are brown.



2. **There is differential reproduction.**

Since the environment can't support unlimited population growth, not all individuals get to reproduce to their full potential. In this example, green beetles tend to get eaten by birds and survive to reproduce less often than brown beetles do.



3. **There is heredity.**

The surviving brown beetles have brown baby beetles because this trait has a genetic basis.



4. **End result:**

The more advantageous trait, brown coloration, which allows the beetle to have more offspring, becomes more common in the population. If this process continues, eventually, all individuals in the population will be brown.



If you have variation, differential reproduction, and heredity, you will have evolution by natural selection as an outcome. It is as simple as that.

## Natural selection at work

Scientists have worked out many examples of natural selection, one of the basic mechanisms of evolution.

Any coffee table book about natural history will overwhelm you with full-page glossies depicting amazing adaptations produced by natural selection, such as the examples below.



Orchids fool wasps into "mating" with them.



Katydid has camouflage to look like leaves.



Non-poisonous king snakes mimic poisonous coral snakes.

Behavior can also be shaped by natural selection. Behaviors such as birds' mating rituals, bees' wiggle dance, and humans' capacity to learn language also have genetic components and are subject to natural selection. The male blue-footed booby, shown to the right, exaggerates his foot movements to attract a mate.



In some cases, we can directly observe natural selection. Very convincing data show that the shape of finches' beaks on the Galapagos Islands has tracked weather patterns: after droughts, the finch population has deeper, stronger beaks that let them eat tougher seeds.

In other cases, human activity has led to environmental changes that have caused populations to evolve through natural selection. A striking example is that of the population of dark moths in the 19th century in England, which rose and fell in parallel to industrial pollution. These changes can often be observed and documented.

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